

*Impatiens macrovexilla* var. *yaoshanensis* S. X. Yu, Y. L. Chen & H. N. Qin, a new variety of Balsaminaceae from Guangxi, China

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**Abstract** *Impatiens macrovexilla* Y. L. Chen var. *yaoshanensis* S. X. Yu, Y. L. Chen & H. N. Qin, a new variety of Balsaminaceae from Guangxi, China, is described. Variety *yaoshanensis* differs from the typical variety by having ovate-orbicular or ovate-oblong leaves, entire lateral sepals, an obvious auricle and entire distal lobe of the alae and visibly ridged seeds. Micromorphological characters of the pollen grains and seed surface under SEM of the two varieties also support the recognition of this taxon.

**Key words** *Impatiens*, *Impatiens macrovexilla* var. *yaoshanensis* S. X. Yu, Y. L. Chen & H. N. Qin, new variety, Balsaminaceae, Guangxi, China.

In 2004, one of us (Yu) carried out field exploration in Guangxi and collected many species of *Impatiens*. After studying the collections morphologically and comparing their distributions, we noted that some plants resembling *Impatiens macrovexilla* Y. L. Chen did not match that species exactly. We then observed the micromorphology of the pollen grains and seed coat and determined that the collections represented a new variety, which we here describe.

1 Material and methods

Materials: Specimens used in this study are housed in the Institute of Botany herbarium (PE; Table 1).

Table 1 Source of material

Taxon	Locality	Voucher
<i>Impatiens macrovexilla</i> Y. L. Chen var. <i>yaoshanensis</i> S. X. Yu, Y. L. Chen & H. N. Qin	Jinxiu, Guangxi (广西金秀)	S. X. Yu (于胜祥) 3661 (PE)
<i>Impatiens macrovexilla</i> Y. L. Chen var. <i>macrovexilla</i>	Guilin, Guangxi (广西桂林)	S. X. Yu (于胜祥) 3350 (PE)

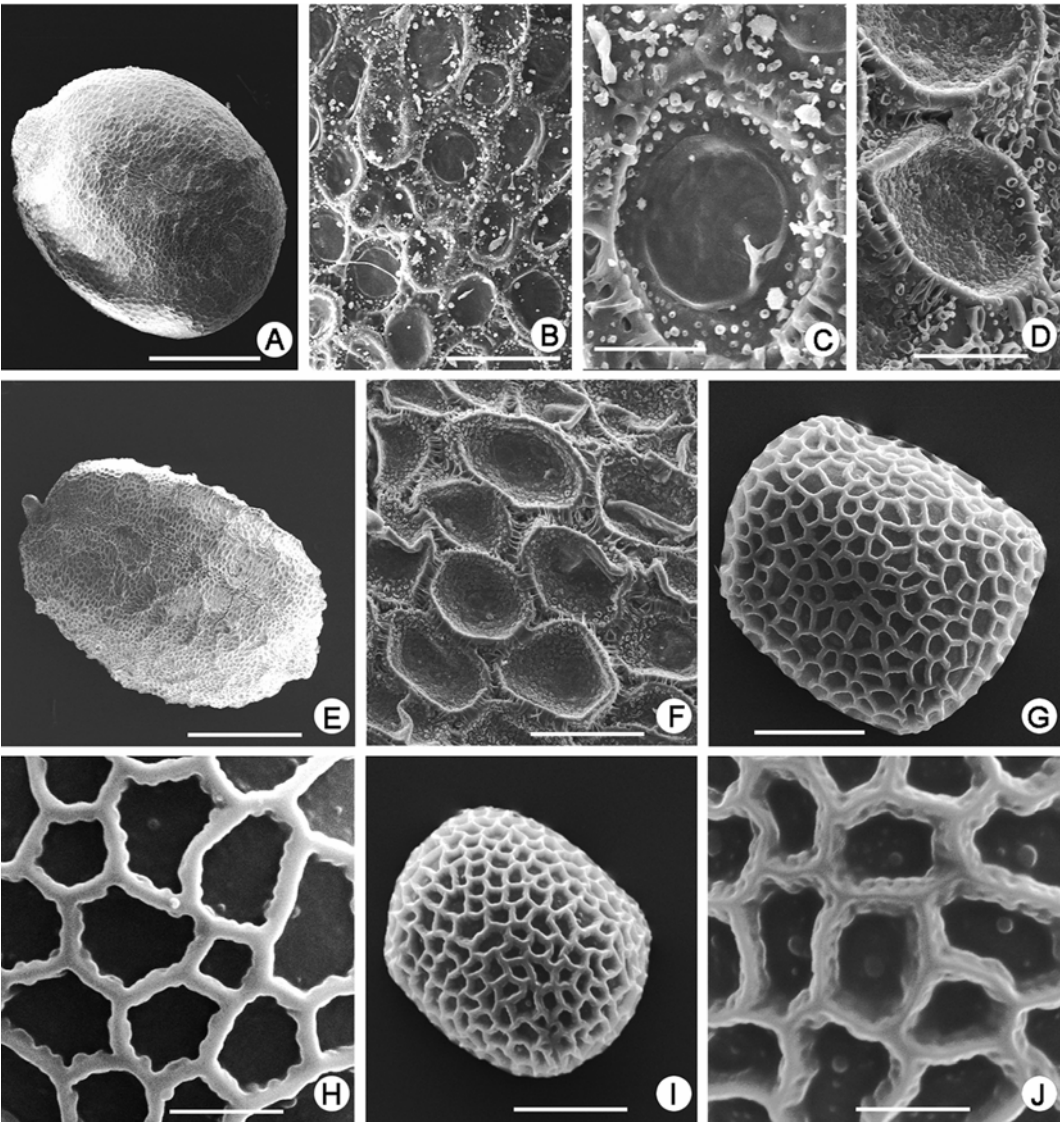
Methods: Mature, full, pollen grains and seeds from specimens were directly observed and measured under magnification using anatomical lens. We then mounted the pollen grains and seeds on stubs using double sided adhesive tape and coated them with a layer of gold and studied and photographed them using a HITACHI S-570 SEM fitted with a camera. The morphological characters are described according to references for pollen grains (Wang & Wang, 1983) and for seeds (Liu et al., 2004), respectively. The average, maximum and minimum values were calculated based on data from 20 pollen grains and 20 seeds.

Received: 13 March 2006 Accepted: 30 May 2007  
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## 2 Results

### 2.1 Seeds

*Impatiens macrovexilla* var. *yaoshanensis*: Seeds ellipsoid,  $2.5(2.3-2.6) \times 1.6(1.5-1.7)$  mm, L (length) / W (width) ratio = 1.56 (Fig. 1: E). Surface ornamentation obviously tubercular, brown; seed coat scrobiculate (Fig. 1: F); scrobiculi with small protuberances (Fig. 1: D).



**Fig. 1.** A–C, G, H, SEM photomicrographs of *Impatiens macrovexilla* var. *macrovexilla*. A–C, Seed. A, Whole view. B, C, Partial view. G, H, Pollen grain. G, Polar view. H, Partial view. D–F, I, J, SEM photomicrographs of *Impatiens macrovexilla* var. *yaoshanensis*. D–F, Seed. D, F, Partial view. E, Whole view. I, J, Pollen grain. I, Polar view. J, Partial view. Scale bars: A, 0.60 mm; B, 0.50 mm; C, D, 15  $\mu$ m; E, 0.86 mm; F, 50  $\mu$ m; G, I, 12  $\mu$ m; H, J, 3  $\mu$ m.

*Impatiens macrovexilla* var. *macrovexilla*: Seeds subspheroid,  $1.6(1.3-1.7) \times 1.3(1.2-1.5)$  mm, L/W ratio = 1.23 (Fig. 1: A). Surface ornamentation slightly tubercular, brown; seed coat scrobiculate (Fig. 1: B), scrobiculi glabrous (Fig. 1: C).

## 2.2 Pollen grains

*Impatiens macrovexilla* var. *yaoshanensis*: Pollen grains suboblate, irregularly reticulate, average size  $E1 \times E2 = 28.81(27.13-29.98) \times 24.18(23.70-24.82)$   $\mu\text{m}$  (Fig. 1: I).

*Impatiens macrovexilla* var. *macrovexilla*: Pollen grains suboblate,  $E1 \times E2 = 34.58(33.65-35.82) \times 28.82(27.31-30.90)$   $\mu\text{m}$  (Fig. 1: G).

Although the surface of the pollen grains in both varieties is reticulate, the muri of var. *macrovexilla* are much smoother than in var. *yaoshanensis* (Fig. 1: H, J).

## 3 Discussion

*Impatiens macrovexilla* var. *yaoshanensis* is characterized by its ovate-orbicular or ovate-oblong leaves, entire later sepals, obvious auricle wings, lobe of wings unlobed distally and seeds visibly ridged. These characteristics are different from those found in the typical species. There are also obvious differences in the micro morphology of the seed coat and pollen grains of the two varieties.

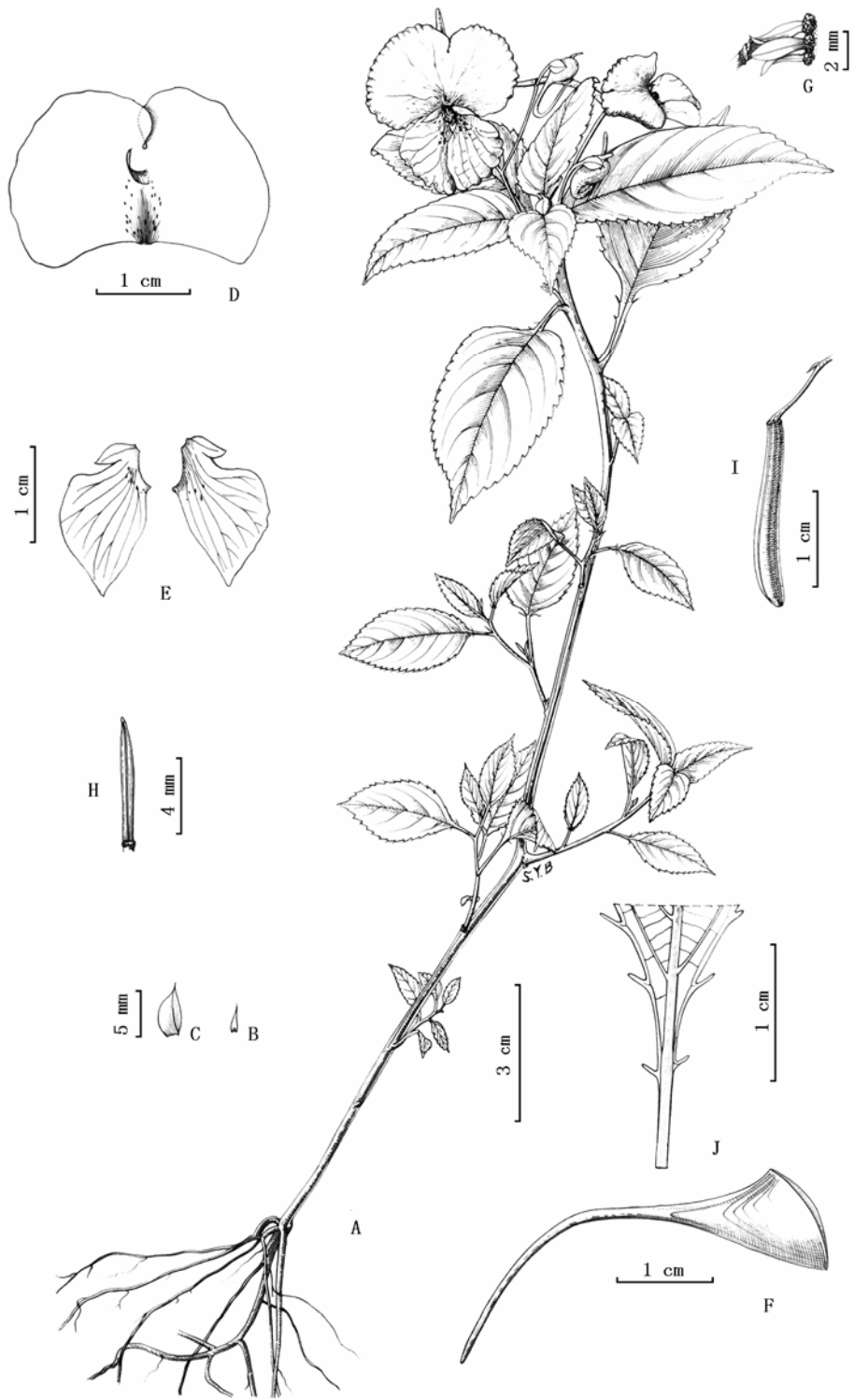
## 4 Taxonomic treatment

***Impatiens macrovexilla* Y. L. Chen var. *yaoshanensis* S. X. Yu, Y. L. Chen & H. N. Qin, var. nov.** Fig. 2

A var. *macrovexilla* differt foliis ovato-orbiculatis vel ovato-oblongis, sepalis lateralibus integris, lobis distalibus integris, auricula dorsalis reflexa, seminis rugosis.

Annual herbs, 40–60 cm tall, glabrous. Stems fleshy, erect, simple or branched above the middle, often rooting at lower swollen nodes. Leaves alternate, somewhat aggregated distally, subsessile or petiolate; petiole to 2.5 cm long; blade 6–8(–12) cm long, 2.5–4.5 cm wide, orbicular-ovate or elliptic-lanceolate, base attenuate with 1–2 pair glands, margin crenate, apically fimbriate, apex acuminate or more or less caudate, abaxially pale green, adaxially dark green, both surfaces glabrous, midvein on lower surface obvious, lateral veins 6–8 pairs, arcuate. Inflorescences in upper leaf axils, (1)2-flowered. Peduncle 4–7 cm long, glabrous; pedicel 3–4 cm long, slender, bracteate in middle; bracts 3–4 mm long, linear, persistent. Flowers 4.5–5.5 cm long, reddish. Sepals 3, lateral sepals 2, 4–5 mm long, green, obliquely ovate, apex acuminate. Lip (lower sepal) ca. 1.2 cm long, narrowly infundibuliform, mouth truncate, apex obtuse, reddish, constricted to spur; spur 3–3.5 cm long, slightly incurved or straight, apex slightly bifid. Standard ca. 1.6 cm long, ca. 3.5 cm wide, oblate or reniform, apex emarginate, dorsal appendage ca. 4 mm long, green, crested. Wings ca. 2 cm long, with deep reddish patches at base; basal lobe ca. 5 mm long, ca. 2 mm wide, narrowly ovate-lanceolate, apex acuminate; distal wing ca. 1.5 cm long, ca. 1.1 cm wide, semiorbicular, inner margin emarginate, appendaged, appendage auricle shaped, inflexed, apex obliquely acuminate. Stamens 5; filaments ca. 3 mm long, linear; anthers without appendage, apex obtuse. Ovary 4–5 mm long, erect, glabrous. Capsule 2–2.5 cm long, clavate, polyspermous; seeds subellipsoid,  $2.5 \times 1.6$  mm, L/W = 1.56, brown, obviously rugose. Fl. Apr.–Jun., Fr. May–Jul.

**China. Guangxi** (广西): Jinxiu (金秀), 2005-05-22, S. X. Yu (于胜祥) 3661 (holotype, PE), near Mt. Shengtang Shan (圣堂山), 2005-05-23, S. X. Yu (于胜祥) 3669 (IBK, PE), 2003-08-01, Y. Liu *et al.* (刘演等) H0403 (IBK, PE).



**Fig. 2.** *Impatiens macrovexilla* var. *yaoshanensis* S. X. Yu, Y. L. Chen & H. N. Qin. A, habit; B, bract; C, lateral sepal; D, vexillum; E, alae; F, labellum; G, filaments and anthers; H, ovary; I, capsule; J, base of a leaf. Drawn by Y. B. Sun from S. X. Yu 3661.

**Acknowledgements** We are deeply grateful to Dr. David BOUFFORD for checking English. We thank Mr. SUN Jing-Tian for his help with the microphotography and scanning electron microscope (SEM), and Mr. SUN Ying-Bao for drawing the habit illustrations.

**References**

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广西凤仙花属(凤仙花科)一新变种——瑶山凤仙花

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**摘要** 描述了中国广西凤仙花科Balsaminaceae凤仙花属*Impatiens*一新变种——瑶山凤仙花*I. macrovexilla* var. *yaoshanensis* S. X. Yu, Y. L. Chen & H. N. Qin。该变种与原变种不同在于叶卵圆形或卵状矩圆形，侧生萼片全缘，翼瓣的上部裂片全缘，翼瓣背部的小耳明显，此外花粉形态和种皮纹饰等性状也支持该变种的建立。

**关键词** 凤仙花属; 瑶山凤仙花; 新变种; 凤仙花科; 广西; 中国